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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/361,980 07/28/99 ITO

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EXAMINER

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LIMEZ ERONINI, J

ART UNIT

PAPER NUMBER

1765

DATE MAILED:

02/14/01

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/361,980

Applicant(s)
Ito et al.

Examiner
Lynette T. Umez-Eronini

Group Art Unit
1765



- ☐ Responsive to communication(s) filed on _____.
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-25 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☒ Claim(s) 1-3 is/are allowed.
- ☒ Claim(s) 4-25 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☒ The proposed drawing correction, filed on Jul 28, 1999 is ☒ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☒ received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3
- ☐ Interview Summary, PTO-413
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed July 28, 1999 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because no English translation or equivalence was provided for Japanese reference lettered **OR**, **PR**, and **QR**. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In claim 4, lines 5 and 6, "removing a part of the photo-resist filling the first opening to form the second opening." is indefinite because its meaning is unclear.

In claim 12, lines 8 and 9, "a ratio of which relative to an upper surface area of the thin film resistor is equal to . . ." is indefinite because it is unclear what is the ratio.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 5, 6, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruggiero (US 4,878,770).

Ruggiero teaches a method of etching a metallic film, comprising steps of:

forming a TiW barrier layer **24** (metallic film) on a thin film resistor (column 3, lines 24, 25, and 60);

forming an Al layer **28** (conductive film) on the TiW barrier layer **24** (metallic film) with a first opening exposing the metallic film thereon (column 3, lines 58-61).

A photoresist (not shown in Figure 5) is laid on the Al layer **28**, a wet-chemical etchant such as "PAN" (phosphoric, acetic and nitric acid) is applied to remove the non-

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masked portions of aluminum and another wet-etchant such as H_2O_2 removes the corresponding portions of the barrier layer **24** (metallic film), (column 3, lines 61-68). In another embodiment plasma etching (dry etching) is employed to remove, simultaneously layers **22**, **24**, and **28** in the non-masked regions (column 4, lines 39-43), which reads on,

dry etching a second part of the metallic film through the first opening to expose the thin film resistor from the first opening, the second part underlying the first part and directly contacting the thin film resistor.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7, 8, 9, and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruggiero (US 4,878,770) as applied to claim 5.

Ruggiero differs in failing to specify recited processing parameters in claims **7, 8, and 11, 12, and 13**.

It would have been obvious to modify Ruggiero by employing a variety of processing variables such as the thickness and area of the metallic layer. These variables

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are known in the etching art to affect the rate and quality and of the etching process. The selection of a particular value would be optimized by conducting routine experimentation for the purpose of obtaining the best etched product.

Claim Rejections - 35 USC § 102

8. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Nagahata (JP 63062746A, English Abstract).

Nagahata teaches a method of etching a metallic film, comprising the steps of:

forming a glaze layer **2** (an insulation layer) on the surface of and a resistor layer **3** (thin film resistor) on an insulating substrate **1** (semiconductor). Figure **1a** shows that the glaze layer (insulation layer) is interposed between the resistor and the semiconductor substrate. Aluminum conductor layers **5** and **6** are formed on the glaze layer in a laminated state by oxidizing layer **5** to form the oxide film layer **7** which lies between layers **5** and **6**. A photoresist method is adapted to the conductor layer **6** to form lead conductors **6a** and **6b**, in an etching tank. Figures **1b** and **1c** show that the oxide film layer **7** and the conductor layer **5** (metallic film) are etched which reads on wet-etching the surface oxide layer and the metallic film.

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Claim Rejections - 35 USC § 103

9. Claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Nagahata (JP 63062746A, English Abstract) as applied to claim 19, in view of Iida (JP 03012960A, English Abstract).

Nagahata differs in failing to teach preparing different first and second metallic films and exposing them by contacting with a specific solution, such that a difference in electrode potential lies therebetween, **in claim 22**.

Iida teaches laminating a CrSi thin film resistor **24**, a TiW film **25** and an aluminum wiring layer **27** on a silicon oxide film **23** which reads on preparing the first and second metallic films laminated with each other, wherein they are different.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Nagahata by laminating different metallic films as taught by Iida for the purpose of obtaining the best electrode and that different metallic films would have different electromotive activities that enable an electric current to flow in the presence of an electrolyte for the purpose of obtaining the best electrode.

Allowable Subject Matter

10. Claims 1-3 are allowed.

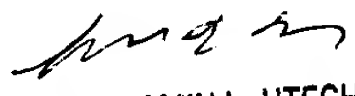
11. The following is an examiner's statement of reasons for allowance: Prior art lacks a method of forming a mask on a conductive layer wherein the mask has a second opening

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that is smaller than the first opening and the mask opens in the first opening to expose an underlying metallic film, and etching a metallic film through the second opening.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is (703) 306-9074.


BENJAMIN L. UTECH
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February 10, 2001